IN THE CLAIMS

1. A method for improving the environmental stress crack resistance of an elastomer-modified monovinylaromatic polymer material, comprising:

introducing a monovinylaromatic monomer feed stream into polymerization reactor;

introducing an elastomer feed stream into said polymerization reactor;

introducing a polymerization initiator compound into said reactor, said initiator compound comprising at least one perketal and at least one peroxycarbonate; and

reacting said monomer, said initiator compound, and elastomer to form an elastomer-modified monovinylaromatic polymer having high ESCR value.

2. The method of claim 1 wherein said perketal is added in amounts of about 200 parts per million, by weight, and said peroxycarbonate is added in amounts ranging from about 150 to about 800 PPM, by weight.

3. The method of claim 1 wherein said perketal comprises Lupersol L-231 and said peroxycarbonate comprises t-Amyl 2-Ethylhexyl peroxycarbonate.

4. The method of claim 3 wherein said perketal is added in amounts of about 200 PPM by weight and said peroxycarbonate is added in amounts of about 400 PPM by weight.

5. The method of claim 4 further comprising adding to said reactor at least one chain transfer agent and at least one lubricant, said lubricant being selected from the group consisting of mineral oil and polyisobutylene.

6. The method of claim 5 wherein said chain transfer agent is a mercaptan, and is added in amounts of around 500 PPM, by weight.

7. The method of claim 5 wherein said lubricants added are mineral oil and polyisobutylene.

8. A process for producing cupgrade high impact polystyrene having improved gel content and grafting levels with reduced elastomer contents, aid process comprising:

introducing a styrene monomer feed stream into a polymerization reactor;

introducing a reduced-level elastomer feedstream into said reactor along with said styrene monomer feed;

introducing an initiator compound into said reactor, said compound comprising at least one perketal initiator and at least one peroxy-carbonate initiator; and,

reacting said feedstreams and initiator compound to produce impact resistant polystyrene.

9. The process of claim 8 wherein said perketal is Lupersol L-233 added in amounts of about 200 PPM, by weights, and said peroxycarbonate is TAEC in amounts of about 600 PPM, by weight.